What is a MERV Rating and Which MERV Rating is Right for my Dust Collector?

What is a MERV Rating?

Picking a filter material for your dust collector is like trying to pick a new car. There are many options, some value priced, others more expensive. Factors to be considered include performance, the environment where the car will be driven and what the car will be used for. Is it toting a family of five or one? Will it be used in a cold weather or warm weather climate? For example, while a BMW convertible is a beautiful car that no doubt has wonderful performance and luxury features, it's probably not the best most practical option for a family of five with three children living in Alaska. Likewise, a single young woman living in an apartment New York City probably doesn't need a large pick-up truck.

It's important to match the performance and characteristics of the vehicle with the needs of the buyer. The same is true for filters. A woodworking facility processing sawdust that generates large dust particles probably doesn't need a filter that is designed for fine dust capture. Likewise a plant that is processing carcinogenic materials will need to be very efficient at capturing microscopic dust particles. One measure that can be helpful in determining which filters are more efficient at capturing fine dust particles is called a MERV Rating.

The term MERV is an acronym which stands for "Minimum Efficiency Reporting Value". MERV Ratings are numerical values assigned to filters that assess the particle size efficiency or PSE of a given filter material. PSE is the average particle size that is captured by the filter after several filtration tests are performed. Testing involves filtering various size particles from microscopic dust particles to larger particles such as sawdust or pollen through the system to measure filter efficiency.

The higher the MERV rating, the better the filter is at capturing very small particles of dust. For example a filter with a MERV rating of 20 would be able to efficiently capture nearly 100% of all microscopic particles such as viruses, smoke and carbon dust whereas a filter with a MERV of 4 efficiently captures 20% of pollen, dust mites and other larger dust particles.

How does MERV Rating affect my dust collector's performance?

A higher MERV rating does not necessarily mean that the filter is going to capture more dust or improve performance for your application. The key factor in deciding which MERV rating will maximize your collector's performance and efficiency at the best value is to look at the size of the dust particles in your work environment. Applications that filter large particles of

dust such as wood dust or metal dust are not going to see a big improvement in efficiency and performance by using higher MERV rated filters. MERV ratings should be considered carefully if the dust being captured is very small. In applications where smoke is being filtered off a plasma cutter for example you may see a big difference in performance and efficiency by selecting a filter with a higher MERV rating.

MERV Rating Application Chart

Take a look at our MERV Rating Application Chart to see examples of applications suited for each MERV.

ASHRAE Standard 52.2				ASHRAE Standard 52.1	Application Guidelines		
	Particle Size Removal Efficiency			Dust-Spot Efficiency Percent	Particle Size and Typical Contaminant	Typical Applications	Typical Air Filter Type
MERV Rating	0.3 to 1	0.3 to 1	0.3 to 1				
20	≥ 99.999	in 0.1 - 0.2 µm particle size		-			
19	≥ 99.999	in 0.3 µm particle size		-			
18	≥ 99.99	in 0.3 µm particle size		-	**< 0.3 µm** Virus (un attached) Carbon Dust Sea Salt All combustion smoke	Electronics manufacturing Pharmaceutical manufacturing Carcinogenic materials	HEPA/ULPA Filters
17	≥ 99.97	in 0.3 µm particle size		-			
16	> 95	> 95	> 95	-	**0.3-1 µm** All bacteria Droplet nuclei (sneeze) Cooking oil Most smoke Insecticide dust Most face powder Most paint pigments	Superior commercial buildings Hospital inpatient care General surgery	**Bag Filters** - Non supported (flexible) microfine fiberglass or synthetic media, 12 to 36 inches deep. **Box filters** - Rigid style cartridge, 6 to 12 inches deep.
15	85-95	> 90	> 90	> 95			
14	75-85	> 90	> 90	90-95			
13	< 75	> 90	> 90	80-90			

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ASHRAE Standard 52.2				ASHRAE Standard 52.1	Application Guidelines		
	Particle Size Removal Efficiency			Dust-Spot Efficiency Percent	Particle Size and Typical Contaminant		
MERV Rating	0.3 to 1	0.3 to 1	0.3 to 1			Typical Applications	Typical Air Filter Type
12	-	> 80	> 90	70-75			
11	-	65-80	> 85	60-65	**1-3 µm** Legionella Humidifier dust	Superior residential Better commercial	**Pleated filters** - Extended surface with cotton or polyester media
10	-	50-65	> 85	50-55			
9	-	< 50	> 85	40-45	Lead dust Milled Flour Auto emission particles Nebulizer drops	Buildings Hospital laboratories	or both, 1 to 6 inches thick. **Box Filters** - Rigid style cartridge, 6 to 12 inches deep.
8	-	-	> 70	30-35			
7	-	-	50-70	25-30			
6	-	-	35-50	< 20	**3-10 µm** Mold Spores Dust mite body parts and droppings Cat and dog dander Hair spray Fabric protector Dusting aids Pudding mix	Better residential Commercial buildings Industrial workspaces	**Pleated filters** - Extended surface with cotton or polyester media or both, 1 to 6 inches thick **Cartridge filters** - Viscous cube or pocket filters **Throwaway** - Synthetic media panel filters
5	-	-	20-35	< 20			
4	-	-	< 20	< 20			
					> 10 µm Pollen Dust mites Cockroach body parts and droppings Spanish moss Sanding dust Spray paint dust Textile fibers Carpet fibers	Minimum filtration Residential window air conditioners	**Throwaway** - Fiberglass or synthetic media panel, 1 inch thick **Washable** - Aluminum mesh, foam rubber panel **Electrostatic** - Self-charging (passive) woven polycarbonate panel

We offer filters for every MERV rating category. To learn more about MERV ratings and all the filter options available, call one of our account managers today at 888-221-0312 or visit us at www.usairfiltration.com